

FINAL REPORT

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"SLS-2 Involvement".

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INTRODUCTION

The purpose of this study is to support Russian space flight experiments carried out on rats flown aboard Space Shuttle Mission SLS-2. The Russian experiments were designed to determine the effects of space flight on immunological parameters. The Russian experiment included the first in-flight dissection of rodents that allowed the determination of kinetics of when space flight affected immune responses.

The support given the Russians by this laboratory was to carry out assays for immunologically important cytokines that could not readily be carried out in their home laboratories. These included assays of interleukin-1, interleukin-6, interferon-gamma and possibly other cytokines. All data will be made available to the Russian investigator, Dr. Andre Lesnyak of the Institute of Biomedical Problems.

METHODS, RESULTS AND DISCUSSION

In the first six months of this study, we have received supernatant fluids from cells from rats flown aboard the Space Shuttle mission SLS-2. Samples received include supernatants from controls, rats flown in space and dissected in space and rats flown in space and dissected upon return to earth.

Production of interleukin-1, interleukin-2, interleukin-4, interleukin-6, tumor necrosis factor-alpha, tumor necrosis factor-beta, interferon-alpha, interferon-gamma was examined. Also, the activity of natural killer cells was examined. The data are included in detailed in the appended tables and manuscript. In summary, changes in immunological parameters were shown to be occurring in cells obtained from in-flight dissections of rats. This is the first time this has been demonstrated. For some immunological parameters, these alterations persisted after flight, but for others there was a return to normal values after flight.

For the first time, it has now been demonstrate that changes in immune response occur during flight, and not just immediately after flight. This could indicate that microgravity could play a role in the alterations in immune responses induced by space flight.

PUBLICATIONS

1. Lesnyak, A., Sonnenfeld, G., Avery, L., Konstantinova, I., Rykova, M., Meshkov, D., and Orlova, T.
Effects of SLS-2 Space Flight on Immunological Parameters of Rats. J. Appli Physiol., In Revision, 1995.
(Appended to this report).